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JOURNAL ARTICLE

The loss of alpha-adrenergic effect during the erectile response in the long-term diabetic rat

T. M. Mills, R. W. Lewis, V. S. Stopper and C. M. Reilly
Department of Physiology and Endocrinology, Medical College of Georgia, Augusta 30912-3000, USA.

The present study was designed to investigate the effect of long-term, streptozotocin-induced diabetes on the erectile response in the laboratory rat. Mean arterial blood pressure (MAP) and intracavernosal blood pressure within the erectile tissue (CCP) were continuously monitored during erection elicited by stimulation of the autonomic innervation of the penis. MAP and CCP were also measured during administration of two drugs: nitroglycerin, a nitric oxide donor drug and phenylephrine, an alpha-adrenergic agonist. The results of these studies show that during graded electrical stimulation of the ganglion, the overall magnitude of the erectile response was greater in the diabetic rats than in untreated control animals. Neither diabetic nor control animals responded significantly to infusion of nitroglycerin. However, diabetic rats and control rats responded very differently to administration of phenylephrine; in the control rats, this alpha agonist caused a sharp decline in CCP as the cavernosal vessels constricted in response to the drug. The same dose of phenylephrine had no discernible effect on CCP in the diabetic animals. This loss of alpha responsiveness may be confined to the penile circulation because MAP was elevated to approximately the same extent in both groups. Taken together, these results show that long-term diabetes leads to a failure of alpha-adrenergic responsiveness in the cavernosal circulation. The greater erectile response to ganglionic stimulation in the diabetic animals is likely due to the loss of response to endogenous norepinephrine.

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